

**Two trichostrongyle genera (Nematoda)
parasitic in malaysian Amphibians :
Batrachostongylus Yuen, 1963 (Amphibiophilidae)
and *Batrachonema* Yuen, 1965 (Nicollinidae)**

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Abstract. — *Batrachostongylus longispiculus* Yuen, 1963, has unique cephalic structures (anterior end of œsophagus swollen anteriorly and divided into three projections, buccal capsule lacking but large dorsal tooth present, mouth wide, *corona radiata* lacking) and female reproductive organs of a strongyle type (*vagina vera* 1.7 mm long, both branches of vestibule of ovejector directed anteriorly). The body cuticle is devoid of longitudinal ridges. This species may be related to the Amphibiophilidae based only on bursal characters. The synlophe (21 ridges with dorsal and vertical ridges larger) and male caudal morphology of *Batrachonema synaptospicula* Yuen, 1965, indicates that this genus belongs to the Nicollinidae. However, the cephalic structures are unique in that there are no lips and the mouth opening is supported by six columnar thickenings.

Résumé. — La morphologie céphalique et celle de l'ovéjecteur de *Batrachostongylus longispiculus* Yuen, 1963, n'indiquent aucune relation avec d'autres trichostrongyles : partie antérieure de l'œsophage gonflée et divisée en trois parties, capsule buccale absente, mais présence d'une forte dent dorsale, bouche très large, *corona radiata* absente, *vagina vera* long de 1,7 mm, les deux branches de l'ovéjecteur dirigées vers l'avant (type strongyle). Le corps n'a pas de crêtes cuticulaires. Cette espèce est liée aux Amphibiophilidae uniquement par la bourse caudale. Le synlophe de *Batrachonema synaptospicula* Yuen, 1965 (21 crêtes, dont les médianes sont les plus grandes), et la disposition des côtes bursales des mâles de ce genre indiquent qu'il appartient aux Nicollinidae ; cependant, sa morphologie céphalique est unique du fait que les lèvres sont absentes et que la bouche est soutenue par six éléments cuticulaires allongés.

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Batrachostongylus Yuen, 1963 (Amphibiophilidae Durette-Desset & Chabaud, 1981), and *Batrachonema* Yuen, 1965 [Nicollinidae (Skrjabin & Schulz, 1937, tribe) Durette-Desset & Chabaud, 1981], are both monospecific genera occurring in frogs of Malaysia. Although the original descriptions are adequate for details of the male caudal end, the morphology of the synlophe and cephalic end of both type species remain inadequately known. Details of these structures, which are important for classification of trichostrongyles, are provided herein. In addition, the ovejector of *Batrachostongylus*, which is unique for the Trichostrongyloidea, is described in detail.

BATRACHOSTRONGYLUS

Batrachostrongylus longispiculus Yuen, 1963

(Fig. 1A-C)

MATERIAL EXAMINED : MNHN no. 418KL.

HOST : *Megophrys montana nasuta* (Pelobatidae).

LOCALITY : Selangor, Malaysia.

Synlophe : The body cuticle is devoid of longitudinal or transverse ridges. In contracted specimens transverse groove-like fixation artifacts occur.

Cephalic structures : There is no cephalic vesicle. The anterior end of the œsophagus is conspicuously swollen. Anteriorly it is divided into a large dorsal and two large subventral apical protuberances which extend up to the mouth opening. The apical edge of each protuberance is lined with thick cuticle. A large dorsal œsophageal tooth is located just below the dorsal apical protuberance. There is no buccal capsule. The oral opening is large and round. Fourteen cephalic papillae were observed : two subdorsal and two subventral digitiform papillae located close beside the edge of the mouth, two lateral digitiform papillae located close to the small amphids, and four outer subdorsal and four outer subventral sessile papillae.

Ovejector : Vagina markedly elongate, divided into short (120 μm), posteriorly directed cuticle-lined duct, and elongate (1.7 mm) anteriorly directed duct surrounded by thin tissue. *Vagina vera* containing up to 34 eggs arranged in single row. Vestibule 70 μm long, anteriorly directed throughout its length, dividing into two equal muscular sphincters 150 μm long. Both infundibula about 200 μm long. One uterus anteriorly, and one posteriorly directed. Eggs in ovejector at early cleavage stage.

COMMENTS

Batrachostrongylus and *Amphibiophilus* Skrjabin, 1916, were separated from other trichostrongyles in a particular family (Amphibiophilidae) by DURETTE-DESSET & CHABAUD (1981). This was to serve to bring together primitive trichostrongyles of frogs presumed to be phylogenetically related to Strongyloidea and to primitive trichostrongyle parasites of mammals and birds such as the Dromaeostrongylidae. Thus *Amphibiophilus* has primitive strongyle-like cephalic structures (buccal capsule present) and a typical trichostrongyle ovejector, whereas *Batrachostrongylus* has trichostrongyle-like cephalic structures and an ovejector strongly resembling a type 1 strongyle ovejector (see LICUTENFELS, 1980). No other trichostrongyles have this forme of ovejector. It is only in the resemblance of their bursas that these two genera may be directly associated. Similarly, a supposed relationship between *Batrachostrongylus* and *Peramelistrongylus* Mawson, 1960 (Dromaeostrongylidae), parasitic in australian marsupials, rests on bursal characters

(see DURETTE-DESSET & BEVERIDGE, 1981b). *Batrachostromylos* could easily be separated from *Amphibiophilus* and given the rank of a subfamily or even a family because of its unusual cephalic and female reproductive morphology, but it would be prudent to keep the classification relatively conservative until the trichostrongyle fauna of the Far East, New Guinea and Australia become better known. It is quite possible that similarity between the bursas of certain Strongyloidea, Amphibiophilidae and Dromaeostromyloidea reflect a true phylogenetic relationship and that this may be revealed with greater clarity when more species become known.

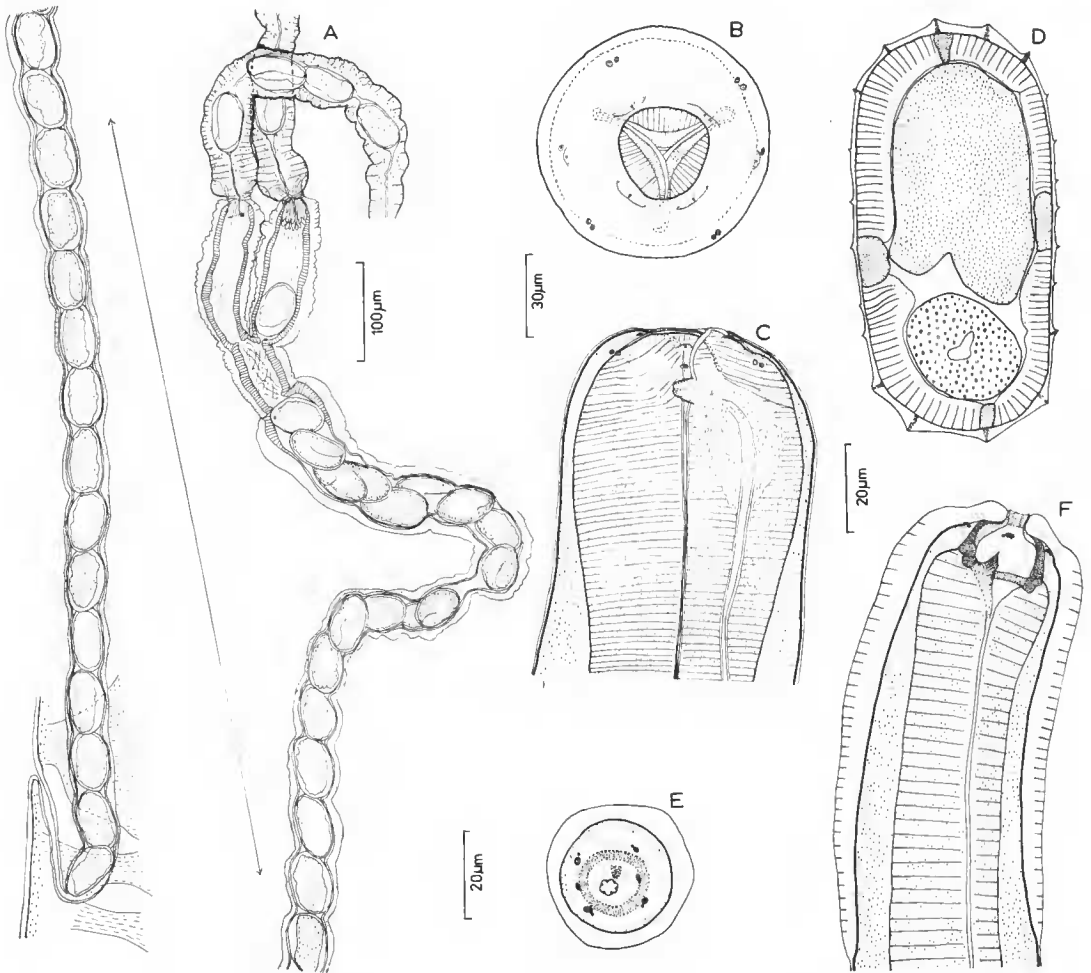


FIG. 1. — A-C : *Batrachostromylos longispiculus* Yuen, 1963. A, ovejector, lateral view ; B, anterior extremity of female, apical view ; C, *idem*, lateral view. — D-F : *Batrachonema synaptospicula* Yuen, 1965 : D, synlophe of female, at mid-body ; E, anterior extremity, apical view ; F, *idem* lateral view.

BATRACHONEMA

Batrachonema synaptospicula Yuen, 1965

(Fig. 1D-F)

MATERIAL EXAMINED : U.S. Nat. Mus. Helm. Coll. no. 75173.

HOST : *Rana macrodon* (Ranidae).

LOCALITY : Burong River, Tg. Karang, Malaysia.

Synlophe : The body is tightly coiled with ridges of the synlophe extending from the anterior to the posterior ends. The synlophe is similar in both sexes, consisting of about 21 ridges. The five dorsal and five ventral ridges are larger than the laterals and have internal sclerotized supports.

Cephalic structures : The cephalic vesicle is large. There are six minute labial papillae and four small cephalic papillae. The amphids are small. The oral opening is markedly small in diameter, with the mouth being formed by a 6-7 μ m long tube supported by six columnar cuticular thickenings. The large buccal capsule is thick-walled and supported posteriorly by a cuticular ring set over the anterior extremity of the œsophagus. There is a single large dorsal tooth.

COMMENTS

The Nicollinidae include two other genera in addition to *Batrachonema* : *Nicollina* Baylis, 1930 (seven species), in Australian monotremes and *Copemania* Durette-Desset & Beveridge, 1981 (one species), in an Australian dasyuroid marsupial. DURETTE-DESSET & BEVERIDGE (1981a) have interpreted this family as having evolved essentially in monotremes with *Copemania* and *Batrachonema* as isolated "captures" from *Nicollina*. The synlophe, bursa, spicules, and ovejector of *Batrachonema* are close to those of *Nicollina* indicating a close relationship between these genera. However, the cephalic end differs in that lips are lacking in *Batrachonema* and the mouth opening is supported by columnar cuticular structures which may be interpreted as a vestigial *corona radiata* or as neoformations. These supports do not closely resemble any oral structures observed in other trichostrongyles. This suggests that *Batrachonema* is indeed a specialized "capture" from *Nicollina*. Its distribution in ranid frogs of Malaysia, far from the present distribution of monotremes, remains to be explained. We note that monotremes and ranid frogs overlap in distribution in New Guinea. Ranidae also occur widely and in considerable diversity in the Indonesian islands and continental Southeast Asia. One monotreme species, the platypus (*Ornithorhynchus*), is aquatic in habits which would bring it into contact with frogs.

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